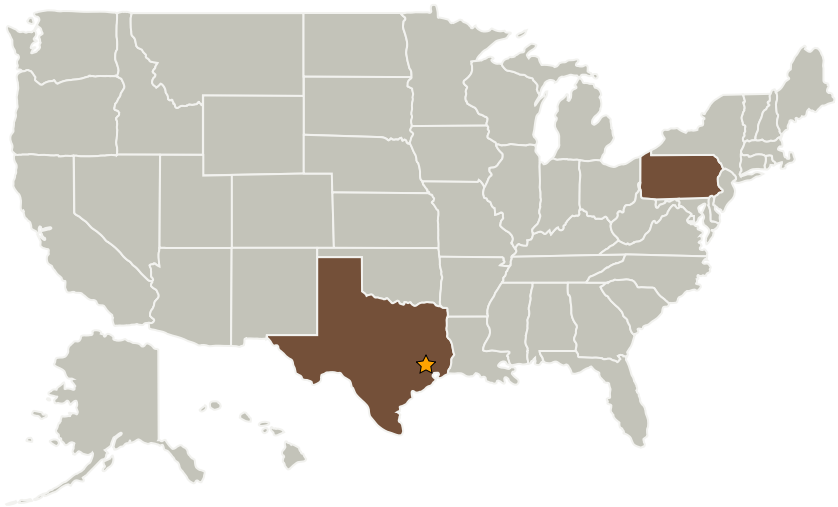
Heat Pipe Heat Exchangers with Double Isolation Layers for Prevention of Interpath Leakage, Phase II

Completed Technology Project (2005 - 2007)

Project Introduction

Advanced Cooling Technologies, Inc. (ACT), supported by Hamilton Sundstrand, proposes to develop a heat pipe heat exchanger that is low mass and provides two levels of isolation between fluid streams. It has potential applications in thermal control of manned spacecraft and a number of military and commercial equipment and processes. Phase I has successfully demonstrated the feasibility of the heat exchanger technology in effectively exchanging heat between two fluid streams while providing reliable separation of the fluids. Components and subscale heat exchangers were tested and the results compared with the heat exchanger design model. The model demonstrated an accuracy of within 8% in its predictions. The principal Phase II objective is to fully demonstrate the proposed technology by refining and further developing the prototype heat exchanger into a qualified full scale design. The project will demonstrate the heat exchanger's long-term compatibility through life test of heat exchanger components and qualification test of engineering units at representative thermal, acceleration, shock and vibration conditions. The Phase II results will elevate the technology to a TRL 6: Prototype demonstration in a relevant environment. The follow-on Phase III will conduct flight qualification test of the technology to address micro gravity operation issues.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Advanced Cooling Technologies, Inc.	Supporting Organization	Industry	Lancaster, Pennsylvania

Primary U.S. Work Locations	
Pennsylvania	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.2 Thermal Control Components and Systems
    - TX14.2.3 Heat Rejection and Storage